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U. S. DEPT. OF AGRICULTURE
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JUL 16 1964

CURRENT SERIAL RECORDS

WATER SUPPLY OUTLOOK

and

FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS
for
MONTANA

UNITED STATES DEPARTMENT of AGRICULTURE...SOIL CONSERVATION SERVICE,

and

MONTANA AGRICULTURAL EXPERIMENT STATION

JUNE 1, 1964

and

SPECIAL MEASUREMENTS

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Data included in this report were obtained by the agencies
named above in cooperation with Federal, State, and private
organizations listed on the inside back cover of this report.

UNITED STATES DEPARTMENT OF AGRICULTURE - SOIL CONSERVATION SERVICE

To Recipients of Water Supply Outlook Reports:

The climate of the cultivated and populated areas of the West is characterized by relatively dry summer months. Such precipitation as occurs falls mostly in the winter and early spring months when it is of little immediate benefit to growing crops. Most of this precipitation falls as mountain snow which stays on the ground for months, melting later to sustain streamflow during the period of greatest demand during late spring and summer. Thus, nature provides in mountain snow an imposing water storage facility.

The amount of water stored in mountain snow varies from place to place as well as from year to year and accordingly, so does the runoff of the streams. The best seasonal management of variable western water supplies results from advance estimates of the streamflow.

A snow survey consists of a series of about ten samples taken with specially designed snow sampling equipment along a permanently marked line, up to 1000 feet in length, called a snow course. The use of snow sampling equipment provides snow depth and water equivalent values for each sampling point. The average of these values is reported as the snow survey measurement for a snow course.

Snow surveys are made monthly or semi-monthly beginning in January or February and continue through the snow season until April, May or June. Currently more than 1400 western snow courses are measured each year. These measurements furnish the key data for water supply forecasts.

Streamflow forecasts are obtained by a comparison of total or maximum snow accumulation, as measured by snow water equivalent, to the subsequent spring and summer or snowmelt season runoff over a period of years. The snow water equivalent measured in selected snow courses provides most of the index to the streamflow forecast for the following season. More accurate forecasts are usually obtained when other factors such as soil moisture, base flow and spring precipitation are considered and included in the forecast procedure. Early season forecasts assume average climatic conditions through the snowmelt season.

Listed below are the Federal-State-Private Cooperative Snow Survey and Water Supply Forecast reports available for the West which contain detailed information on snow survey measurements, streamflow forecasts, reservoir storage, soil moisture and other guide data to water management and conservation decisions. Soil Conservation Service Reports may be secured from Water Supply Forecasting Unit, Soil Conservation Service, P.O. Box 2807, Portland, Oregon 97208.

PUBLISHED BY SOIL CONSERVATION SERVICE

<u>REPORTS</u>	<u>ISSUED</u>	<u>LOCATION</u>	<u>COOPERATING WITH</u>
RIVER BASINS			
WESTERN UNITED STATES			
WESTERN UNITED STATES	MONTHLY (FEB.-MAY)	PORTLAND, OREGON	ALL COOPERATORS
BASIC DATA SUMMARY			
BASIC DATA SUMMARY	OCTOBER 1	PORTLAND, OREGON	ALL COOPERATORS
STATES			
ALASKA	MONTHLY (MAR.-MAY)	PALMER, ALASKA	ALASKA S.C.D.
ARIZONA	SEMI-MONTHLY (JAN. 15 - APR. 1)	PHOENIX, ARIZONA	SALT R. VALLEY WATER USERS ASSOC. ARIZ. AGR. EXP. STATION
COLORADO AND NEW MEXICO	MONTHLY (FEB.-MAY)	FORT COLLINS, COLORADO	COLO. STATE UNIVERSITY COLO. STATE ENGINEER N. MEX. STATE ENGINEER
IDAHO	MONTHLY (JAN.-JUNE)	BOISE, IDAHO	IDAHO STATE RECLAMATION ENGINEER
MONTANA	MONTHLY (JAN.-JUNE)	BOZEMAN, MONTANA	MONT. AGR. EXP. STATION
NEVADA	MONTHLY (JAN.-MAY)	RENO, NEVADA	NEVADA DEPT. OF CONSERVATION AND NATURAL RESOURCES - DIVISION OF WATER RESOURCES
OREGON	MONTHLY (JAN.-JUNE)	PORTLAND, OREGON	OREG. STATE UNIVERSITY OREGON STATE ENGINEER
UTAH	MONTHLY (JAN.-JUNE)	SALT LAKE CITY, UTAH	UTAH STATE ENGINEER
WASHINGTON	MONTHLY (FEB.-JUNE)	SPOKANE, WASHINGTON	WN. STATE DEPT. OF CONSERVATION
WYOMING	MONTHLY (FEB.-JUNE)	CASPER, WYOMING	WYOMING STATE ENGINEER

PUBLISHED BY OTHER AGENCIES

<u>REPORTS</u>	<u>ISSUED</u>	<u>AGENCY</u>
BRITISH COLUMBIA	MONTHLY (FEB.-JUNE)	WATER RESOURCES SERVICE, DEPT. OF LANOS, FOREST AND WATER RESOURCES, PARLIAMENT BLDG., VICTORIA, B.C., CANADA
CALIFORNIA	MONTHLY (FEB.-MAY)	CALIF. DEPT. OF WATER RESOURCES, P.O. BOX 388, SACRAMENTO, CALIF.

WATER SUPPLY OUTLOOK
FEDERAL-STATE-PRIVATE COOPERATIVE SNOW SURVEYS
for
MONTANA

Report Prepared
By
Phillip E. Farnes
and
Stanley E. Cook

Snow Survey and Water Supply Forecasting Section
Soil Conservation Service
Box 855
Bozeman, Montana

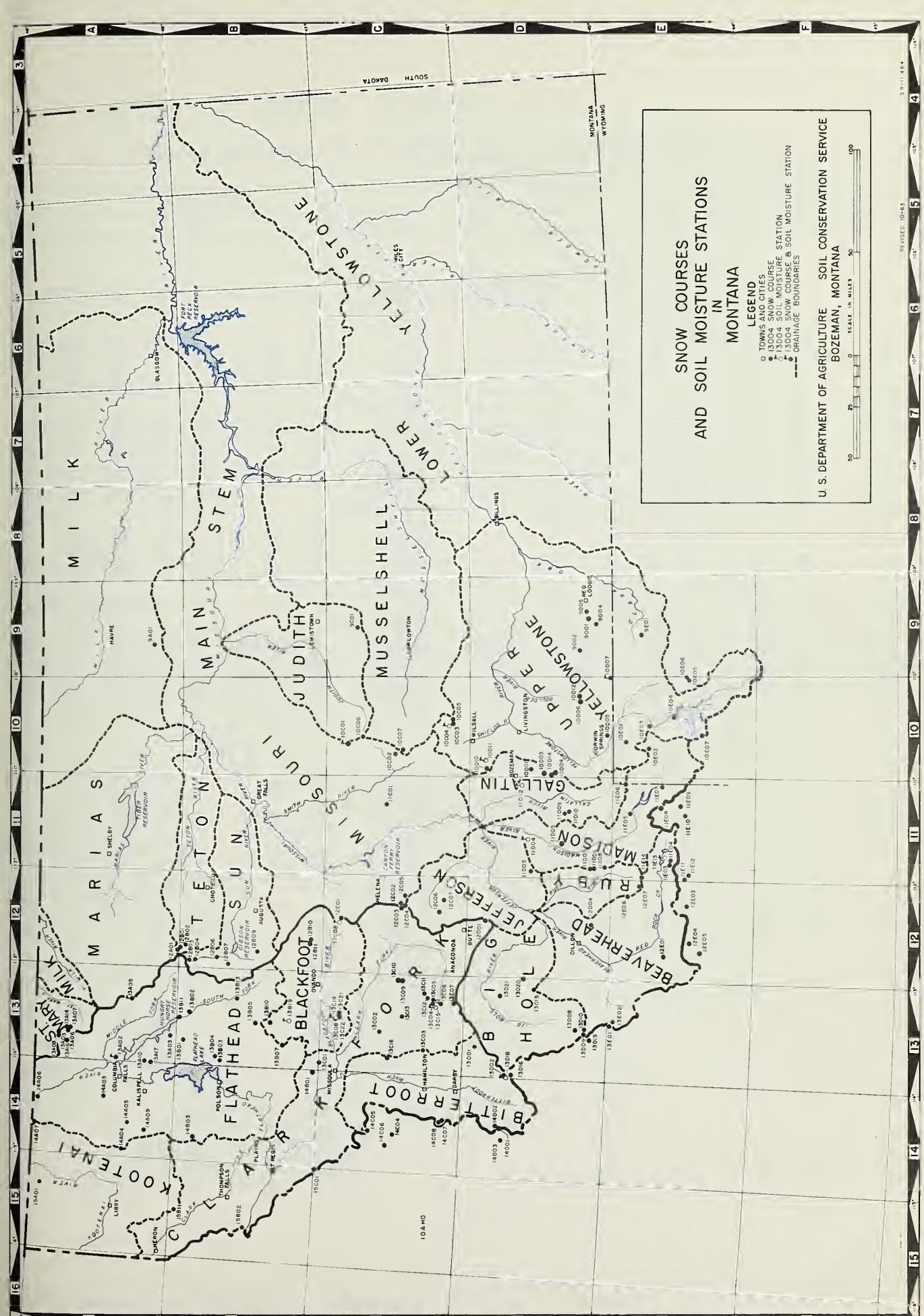
Issued By

H. D. Hurd
State Conservationist
Soil Conservation Service
Bozeman, Montana

J. A. Asleson, Director
Montana Agricultural
Experiment Station
Bozeman, Montana

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INDEX TO MONTANA SNOW COURSES AND SOIL MOISTURE STATIONS

SNOW COURSES

Drainage Basin & Course Name	Number	Elev.	Sec.	Top.	Range	Record Began	Measuring Dates ✓	Mess. by ✓	Drainage Basin & Course Name	Number	Elev.	Sec.	Top.	Range	Record Began	Measuring Dates ✓	Mess. by ✓							
COLUMBIA RIVER BASIN																								
GALATIN RIVER																								
MISSOURI RIVER MAIN STEM																								
Barre Creek	15811	5200	36	26N	31W	1956	3,4,5,5 ₆	2	Arch Falls	10014	7260	3	56	6E	1963	2,3,4,5	1							
Brush Creek	15404	5200	12	30N	26W	1937	3,4,5	1,2	Bear Basin	11D09	6150	9	65	15	1963	3,4,5	1							
Red Mountain	15401	6000	4	36N	29W	1937	3,4,5,5 ₆	1,2	Devil's Slide	10D04	8100	14	55	6E	1935	2,3,4,5	1							
Weasel Divide	14407	5450	8	37N	24W	1937	3,4,5,5 ₆	1,2	Hood Meadow	10003	6600	22	45	6E	1935	2,3,4,5	1							
FLATHEAD RIVER																								
Bassack Peak	14803	5150	11	24N	25W	1961	3,4,5	1,5	Little Park	11D10	7400	22	65	3E	1963	3,4,5	1							
Big Creek	13003	6750	7	22N	18W	1943	3,4,5	6	New World	10001	6700	24	35	6E	1939	2,3,4	1							
Camp Misery	13017	6400	30	28N	18W	1962	3,4,5	1,2	Twenty-One Mile	11E06	7150	1	115	5E	1934	1,2,3,4,5	3							
Desert Mountain	13A02	5600	24	31N	19W	1937	1,2,3,4,5	6	GALATIN RIVER															
Fatty Creek	13B04	5500	4	22N	18W	1962	3,4,5	6	MISSOURI RIVER MAIN STEM															
Gold Creek Divide	13A09	5150	11	20N	19W	1960	3,4,5	1,5	Boulder Mountain	11C01	7950	1	9N	3E	1963	3,4	1							
Hell Roaring Divide	14A03	5770	35	32N	22W	1942	1,2,3,4,5,5 ₆	2	Chesman Reservoir	12C05	6200	2	8N	5W	1936	1,2,3,4,5	3							
Holbrook	13B13	4530	18	21N	13W	1951	2,3,4,5	1	Crystal Lake	9C01	6100	19	12N	18E	1941	3,4	1							
Kishbehne	14A05	3890	14	37N	22W	1954	3,4	6	Elk Peak	10C07	8000	10	8N	6E	1963	3,4,5	1							
Logan Creek	14A05	4300	34	30N	19W	1937	3,4,5	1,2	Goat Couper	10C08	7000	19	9N	5E	1938	3,4,5	3							
Maris Pass	13A05	5250	34	30N	19W	1934	1,2,3,4,5	3	Kings Hill	10C01	7500	34	12N	8E	1934	3,4,5	3							
Maris Creek	13A06	4000	28	30N	19W	1937	3,4	6	Rocky Boy	9A01	5200	15	28N	16E	1961	3,4	7							
North Fork Jocko	13B07	6330	3	17N	17W	1943	1,2,3,4,5,5 ₆	1,5	Stample Pass	12C01	6900	16	13N	7N	1934	3,4,5	3							
Spotted Bear Mountain	13B02	7000	23	25N	19W	1948	1,2,3,4,5	1,2	Ten Mile Lower	12C02	6250	13	8N	6W	1935	1,2,3,4,5	3							
Strawberry Lake	13A10	5600	11	28N	19W	1948	3,4,5	1	Ten Mile Middle	12C03	6500	13	8N	6E	1934	1,2,3,4,5	3							
Trinaku Lake	13B01	6500	9	25N	19W	1948	3,4,5	1	Ten Mile Upper	12C04	8300	19	8N	5E	1935	1,2,3,4,5	3							
Twin Creeks	13B11	3580	24	26N	16W	1951	1,2,3,4,5	1,2	SOUTHERN MARSHAL RIVERS															
Upper Holland Lake	13B05	7000	28	20N	19W	1948	3,4,5	1	Cabin Creek	12B06	5400	33	23N	10W	1949	3,4,5	1							
CLARK RIVER																								
Black Pine	13C13	7300	23	8N	15W	1969	3,4,5	1	Five-Bull	12B09	5600	36	20N	10W	1948	3,4	1							
Copper Creek	13C10	5700	1	12N	9W	1962	3,4,5	1,2	Flat Creek	12B11	6000	13	26N	10W	1948	3,4,5	1							
Cutter Mine	12B11	6250	2	12N	9W	1962	3,4,5	1,2	Goat Mountain	12B07	7000	20	22N	10W	1934	3,4,5	3							
Coyote Hill	13B10	4200	12	18N	16W	1947	1,2,3,4,5	1,2	Weldron Creek	12B02	5600	16	23N	9W	1948	3,4,5	1							
El Dorado Mine	13C09	7800	23	8N	12W	1949	3,4	1	West Fork	12B01	6000	6	25N	9W	1948	3,4,5	1							
Fred Burr Pass	13C11	7200	12	6N	13W	1957	3,4,5	1	Wrong Creek	12B04	5700	32	25N	10W	1949	3,4,5	1							
Gold Creek Lake	13C10	6200	14	8N	12W	1949	3,4	1	Wrong Ridge	12B03	6800	17	25N	10W	1949	3,4,5	1							
Hood Creek	13C04	6450	6	12N	7W	1937	2,3,4,5	1,2	JUDITH RIVER															
Interloop	13C21	5450	19	13N	14W	1951	1,2,3,4,5	8	Spur Park	10C06	8000	20	12N	9E	1963	3,4,5	1							
Lubrecht Forest No. 3	13C21	5450	23	13N	15W	1951	1,2,3,4,5	8	WYOMING RIVER															
Lubrecht Forest No. 4	13C22	4650	23	13N	15W	1951	1,2,3,4,5	8	Bald Ridge	10C05	7500	11	4N	10E	1961	3,4,5	1							
Lubrecht Forest No. 6	13C08	4040	11	15N	15W	1951	1,2,3,4,5	8	Camp Seale	9C01	7890	2	8S	18E	1937	3,4,5	1							
Red Lion	13C12	7100	22	6N	13W	1936	3,4,5	1	Crevice Mountain	10D05	8400	95	9S	1935	3,4	2								
Skaha Lake Summit	13C03	7250	30	6N	17W	1937	3,4,5,5 ₆	1	Grizzly Peak	9C05	8000	26	7S	1935	1,2,3,4,5	1								
Slide Rock Mountain	13C02	7100	39	10N	16W	1937	3,4,5	1	Indigo Pass	10C06	8000	22	7S	12S	1940	3,4,5	1							
Southern Cross	13C05	6500	8	5N	13W	1936	2,3,4	4	Monument Peak	10D12	9000	22	7S	12E	1961	3,4,5	6							
Storm Lake	13C07	7780	19	4N	13W	1939	1,2,3,4,5	1	Northeast Entrance	10D07	7400	33	9S	14E	1937	1,2,3,4,5	1							
Stuart Mill	13C06	6500	19	5N	13W	1936	2,3,4	4	Porcupine R. S.	10C03	6500	10	4N	10E	1938	3,4,5	1							
Stuart Mountain	13C01	7400	6	12N	18W	1936	1,2,3,4,5	6	Timberline Creek	9D04	8850	10	8S	18E	1961	3,4,5	1							
TV Mountain	14B01	6800	33	15N	19W	1956	1,2,3,4,5	8	Scaljeewa	10D10	6550	36	2N	6E	1960	3,4,5	1							
BITTERROOT RIVER																								
Abrose	13C16	6450	28	9N	18W	1960	3,4,5	1	SOIL MOISTURE STATIONS															
East Fork R. S.	13C01	5400	16	2N	19W	1937	3,4	6	COLUMBIA RIVER BASIN															
Cibola Pass	13C02	7100	4	2S	19W	1934	1,2,3,4,5,5 ₆	1,3	Bald Mountain	13A02	5600	24	31N	19W	1956	Monthly	1							
Lost Horse	14C07	5940	5	4N	23W	1960	3,4,5	1	Maris Pass	13A05M	5250	34	30N	14W	1950	Monthly	1							
Nez Perce Camp	14D02	5580	19	1S	23W	1937	3,4,5	1	CLARK RIVER															
Nez Perce Pass	14D01	6570	25	1S	23W	1937	3,4,5	1	FLATHEAD RIVER															
Twin Lakes	14C08	6510	32	5N	23W	1960	3,4,5	1	George Lake	13C15M	6450	6	5N	13W	1962	Monthly	1							
SASKATCHEWAN RIVER BASIN																								
MISSOURI RIVER BASIN																								
MISSOURI RIVER BASIN																								
BEAVERHEAD RIVER																								
MADISON RIVER																								
MISSOURI RIVER MAIN STEM																								
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SNOW SURVEY DATA

AS OF 1964 - Not Previously Published

(inches)

SNOW COURSE			CURRENT DATA			PAST RECORD	
NO.	NAME	ELEVATION	DATE OF SURVEY	SNOW DEPTH	WATER CONTENT	WATER CONTENT	
						LAST YEAR	AVERAGE

COLUMBIA RIVER BASIN

December 1, 1963

Clark Fork River

13C08	Lubrecht Forest No. 6	4040	11/30	0	0	-	-
13C18	Spring Gulch	6000	11/30	0	0	-	-
13C01	Stuart Mountain	7400	11/30	19	4.5	-	-
14B01	TV Mountain	6800	11/29	12	2.3	-	-

May 1, 1964

Flathead River

13A10	Strawberry Lake	5600	5/9	119	53.6	27.2	40.0*
13B01	Trinkus Lake	6100	5/9	126	55.2	33.7	41.4*
13B05	Upper Holland Lake	7000	5/9	105	46.8	28.0	36.8*

MISSOURI RIVER BASIN

March 1, 1964

Yellowstone River

9D02	West Rosebud	7500	3/2	26	6.5	-	-
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SNOW SURVEY DATA

AS OF MAY 15, 1964

(inches)

SNOW COURSE			CURRENT DATA			PAST RECORD	
NO.	NAME	ELEVATION	DATE OF SURVEY	SNOW DEPTH	WATER CONTENT	WATER CONTENT	
						LAST YEAR	AVERAGE

COLUMBIA RIVER BASIN

Kootenai River

15B11	Baree Creek	5500	5/15	111	57.5	25.6	40.4*
BC 10	Fernie	3500	5/13	0	0	0.0	0.7*
BC 43	Gray Creek	5100	5/15	55	23.5	16.3	16.7*
BC 33	Kicking Horse	5400	5/15	24	8.8	10.5	8.4*
BC 32	Marble Canyon	5000	5/19	18	4.5	5.7	8.8*
BC 10A	New Fernie	4100	5/13	2	1.0	0.0	1.3*
BC 10B	Morrissey Ridge	6100	No Report			22.8	-
15A01	Red Mountain	6000	5/14	41	18.0	14.5	16.7*
BC 20A	Sullivan Mine	5100	5/15	20	8.1	4.7	6.8*
14A07	Weasel Divide	5450	5/15	78	36.4	24.4	31.4*

Flathead River

14A03	Hell Roaring Divide	5770	5/14	89	42.5	22.5	-
13B07	North Fork Jocko	6330	5/15	115	59.2	26.4	-

Clark Fork River

13C03	Skalkaho Summit	7260	5/14	68	28.8	23.7	-
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Bitterroot River

13D02	Gibbons Pass	7100	5/15	56	25.9	16.8	19.5*
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SNOW SURVEY DATA

AS OF JUNE 1, 1964

SNOW COURSE			CURRENT DATA			PAST RECORD (inches)	
NO.	NAME	ELEVATION	DATE OF SURVEY	SNOW DEPTH	WATER CONTENT	WATER CONTENT	AVERAGE

COLUMBIA RIVER BASIN

Kootenai River

BC 43	Gray Creek	5100	5/30	36	17.3	8.9	9.9*
BC 33	Kicking Horse	5400	5/29	7	3.0	0.0	-
BC 32	Marble Canyon	5000	5/30	0	0	-	1.5*
BC 10B	Morrissey Ridge	6100	No Report			-	-
15A01	Red Mountain	6000	6/2	5	2.4	0.0	-
14A07	Weasel Divide	5450	6/3	39	21.8	9.2	-

Flathead River

13B03	Big Creek	6750	6/1	91	48.4	37.9	39.7*
13A02	Desert Mountain	5600	6/1	3	1.5	0.0	-
13B04	Fatty Creek	5500	6/1	22	11.8	3.1	-
14A03	Hell Roaring Divide	5770	5/28	53	28.2	2.4	-
13B07	North Fork Jocko	6330	6/2	74	41.8	21.8	28.1*

Clark Fork River

13C03	Skalkaho Summit	7260	6/1	39	19.6	15.4	-
13C01	Stuart Mountain	7400					-
14B01	TV Mountain	6800					-

Bitterroot River

13D02	Gibbons Pass	7100	6/1	24	11.4	1.4	7.4*
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MISSOURI RIVER BASIN

Gallatin River

10D14	Arch Falls	7350	5/31	24	10.0	0	-
10D04	Devil's Slide	8100	5/31	57	25.9	19.5	-

SOIL MOISTURE DATA

AS OF JUNE 1, 1964

(Inches)

SOIL MOISTURE STATION			SOIL PROFILE		CURRENT DATA		PAST RECORD	
NO.	NAME	EL ELEVATION	DEPTH	FIELD CAPACITY	DATE OF SURVEY	SOIL MOISTURE	LAST YEAR	**AVERAGE

COLUMBIA RIVER BASIN

Flathead

13A02M	Desert Mountain	5600	54	8.4	6/1	8.9	8.4	8.6
13A05M	Marias Pass	5250	54	6.5			5.7	5.8

Clark Fork

13C15M	Georgetown Lake	6450	48	8.3	5/28	7.8	7.2	-
13B19M	Seeley Lake	4030	48	10.6	6/1	10.6	9.6	-

Bitterroot

13D18M	Gibbons Pass	7100	48	7.1	6/1	7.2	7.2	-
14C05M	Lolo Pass	5250	48	8.5	5/28	10.2	-	-

MISSOURI RIVER BASIN

Beaverhead

11E13M	Lakeview	6700	48	15.3			14.2	-
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Madison

10D04M	Red Bluff	4800	40	4.7			1.8	-
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Gallatin

11D02M	College Site	4856	54	14.5	5/29	10.4	10.8	11.0
11E06M	Twenty-One Mile	7150	48	8.8	5/28	10.1	-	-

Missouri Main Stem

10C01M	Kings Hill	7420	48	11.8	6/1	10.4	12.1	-
12C08M	Stemple Pass	6350	48	5.9	5/28	5.1	5.4	-

Yellowstone

10D11M	Battle Ridge	6020	48	15.4	6/1	13.9	16.8	-
10D07M	Northeast Entrance	7350	48	9.4	6/2	9.6	9.3	-
10C04M	Shields River	5850	48	17.8	6/1	16.6	17.0	-

RESERVOIR STORAGE DATA

AS OF MAY 31, 1964

(1000 Acre Feet)

BASIN	RESERVOIR	USEABLE CAPACITY	USEABLE STORAGE		
			THIS YEAR	LAST YEAR	AVERAGE

COLUMBIA RIVER BASIN

Flathead	Hungry Horse	3,428.0	2,547.0	2,948.0	2,770.0**
	Flathead Lake	1,791.0	1,556.0	1,703.0	1,607.0
	Camas 1/	45.2	25.1	33.5	33.3
	Mission Valley 2/	100.3	43.6	37.5	66.7
Clark Fork	Georgetown Lake	31.0	28.2	27.5	23.6
	Noxon	334.6	161.7	185.8	-
Bitterroot	Como	34.9	18.1	36.2	28.5
	Painted Rocks	31.7	-	33.2	32.2

MISSOURI RIVER BASIN

Beaverhead	Lima	84.0	53.7	48.3	68.7
Ruby	Ruby	38.8	-	-	36.6**
Madison	Hebgen Lake	384.8	298.0	382.1	298.6
	Ennis Lake	41.0	38.2	39.2	34.7
Gallatin	Middle Creek	8.0	7.2	8.0	6.2**
Missouri	Canyon Ferry	2,043.0	1,851.0	1,998.0	1,803.0**
	Hauser & Helena	61.9	64.2	56.8	52.0
	Lake Helena	10.4	11.3	8.6	7.3**
	Holter Lake	81.9	78.1	75.6	72.9
	Smith River	10.7	11.4	11.4	9.0**
	Ackley Lake	5.8	-	5.9	4.6
	Durand	7.0	7.0	7.0	6.7
	Martinsdale	23.1	13.6	19.3	15.3
	Deadman's Basin	72.2	64.2	65.7	50.8**
	Fort Peck	19,410.0	12,780.0	10,660.0	11,310.0
Sun-Teton	Gibson	105.0	93.1	98.8	97.2
	Willow Creek	32.3	25.2	28.2	24.6
	Pishkun	32.0	31.4	24.2	29.2
Marias	Lower Two Medicine	16.6	15.0	14.7	9.5
	Four Horns	19.2	-	-	9.6
	Swift	30.0	21.6	24.3	29.9
	Lake Francis	112.0	77.6	64.7	106.1
Milk	Tiber	1,313.0	749.7	658.6	736.7**
	Fresno	127.2	98.2	61.8	100.8
	Nelson	66.8	27.2	44.4	38.8
Yellowstone	Lake Sherburne	66.1	15.5	-	36.9
	Mystic Lake	20.8	3.6	4.1	6.2
	Tongue River	68.0	-	-	29.9
	Cooney	27.5	19.8	18.9	18.2

1/ Sum of four small reservoirs on west side of Flathead Lake.

2/ Sum of eight small reservoirs in Mission Valley not including Jocko Lake.

**Agencies Cooperating in Collecting Data Contained
in this Bulletin**

U. S. Forest Service
Region 1, Missoula, Montana

U. S. Geological Survey
Helena, Montana

U. S. Army Corps of Engineers
Portland, Oregon
Seattle, Washington
Omaha, Nebraska
Riverdale, N. D.

U. S. Indian Irrigation Service
St. Ignatius, Montana

U. S. Weather Bureau
Helena, Montana

**U. S. Bureau of Sports Fisheries
and Wildlife**
Red Rock Lakes Refuge
Monida, Montana

U. S. Bureau of Reclamation
Billings, Montana
Boise, Idaho

Montana Power Company
Butte, Montana

Agricultural Experiment Station
North Montana Branch Station
Havre, Montana

Agricultural Experiment Station
North Montana Branch Station
Havre, Montana

National Park Service
Yellowstone National Park
Glacier National Park

Montana Experiment Station
Montana State College
Bozeman, Montana

Bonneville Power Administration
Portland, Oregon

Montana State University
School of Forestry
Missoula, Montana

Soil Conservation Service
Montana, Wyoming, Idaho

Soil Conservation Districts
Montana Counties

Johnson Flying Service, Inc.
Missoula, Montana

**Water Rights Branch, Dept.
of Lands and Forests**
Victoria, British Columbia

**Department of Northern Affairs
and National Resources**
Calgary, Alberta

State Engineer
Montana and Wyoming

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
P.O. BOX 855
BOZEMAN, MONTANA 59715

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FEDERAL - STATE - PRIVATE
COOPERATIVE SNOW SURVEYS

Furnishes the basic data
necessary for forecasting
water supply for irrigation,
domestic and municipal water
supply, hydro-electric power
generation, navigation,
mining and industry

*"The Conservation of Water begins
with the Snow Survey"*

1.96
R 31 Farno
2 of. 2

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OCT 7 1964

WATER SUPPLY OUTLOOK

CURRENT SERIAL RECORDS

FEDERAL-STATE-PRIVATE COOPERATIVE SNOW SURVEYS

for

MONTANA

SPECIAL SNOW SURVEYS

as of
June 16-18, 1964

Report Prepared

By

Phillip E. Farnes

and

Stanley E. Cook

Snow Survey and Water Supply Forecasting Section
Soil Conservation Service
Box 855
Bozeman, Montana

Issued By

H. D. Hurd
State Conservationist
Soil Conservation Service
Bozeman, Montana

J. A. Asleson, Director
Montana Agricultural
Experiment Station
Bozeman, Montana

The mountain snow pack, which was about 50 percent above average on May 1 is still above average, and there is considerable concern that it may contribute to additional floodings.

Heavy precipitation with amounts up to 11 inches in 30 hours combined with the already ripe, fast melting snow pack, to produce severe floods on the Flathead, Marias, Teton and Sun Rivers the second week in June. Early reports indicate streamflow exceeded all previous records in this area. Many other streams and rivers in the state were near or above flood stage during this same period.

Special surveys were initiated when additional information on the high elevation snow pack was desired by the Forest Service and other State and Federal agencies. Two questions hoped to be answered by these late surveys. "Did this precipitation at higher elevations increase the existing snow pack?" and "Is the snow pack that remains large enough to present a potential for additional flooding?"

Even though no past records are available for surveys on this late date, it is felt that comparison between the May 1, May 15, June 1 and current surveys can shed some light on these questions.

There is a possibility that the snow pack was increased but only at extremely high elevations. Generally, the rain increased the rate of snow melt and contributed to the runoff as soils not snow covered were saturated from recent snow melt.

It appears that any drainage in the state with high elevation headwaters is still vulnerable to high runoff with warm temperatures and moderate to heavy precipitation. Data included in this report was forwarded to the U. S. Weather Bureau for their use in flood forecasting and other agencies involved in reservoir regulation as soon as it became available.

These special snow surveys were made by personnel of the Soil Conservation Service, Forest Service, Indian Irrigation Service and MSU School of Forestry.

SNOW SURVEY DATA

AS OF JUNE 16-18, 1964

SNOW COURSE			CURRENT DATA			PAST RECORD	
NO.	NAME	ELEVATION	DATE OF SURVEY	SNOW DEPTH	WATER CONTENT	WATER CONTENT	(inches)
					LAST YEAR		AVERAGE

COLUMBIA RIVER BASIN

Kootenai River

14A07	Weasel Divide	5450	6/17	9	5.0
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Flathead River

13A17	Camp Misery	6400	6/17	68	38.0
14A03	Hell Roaring Divide	5770	6/17	3	1.5
13B07	North Fork Jocko	6330	6/16	42	24.2
13B02	Spotted Bear Mountain	7000	6/17	No Snow	
13B05	Upper Holland Lake	7000	6/17	11	6.0

Note: Average of 10 samples on snow course with no snow on 7 samples. Had water not washed snow from 7 samples, measurement would probably have been about 38 inches deep and 20 inches water, at Upper Holland Lake.

Clark Fork River

15C01	Hoodoo Creek	6200	6/16	35	18.3
13C03	Skalkaho Summit	7260	6/16	17	8.6
14B01	TV Mountain	6800	6/17	8	3.6

Bitterroot River

13D02	Gibbons Pass	7100	6/16	2	1.1
14C07	Lost Horse	5940	6/16	32	18.0
14C08	Twin Lakes	6510	6/16	47	27.4

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AS OF JUNE 16-18, 1964

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MISSOURI RIVER BASIN

Gallatin River

10D14	Arch Falls	7350	6/16	2	1.1
11D09	Bear Basin	8150	6/16	22	10.6
10D04	Devil's Slide	8100	6/16	40	20.4
11D10	Little Park	7400	6/16	No Snow	

Sun-Teton-Marias Rivers

13A11	Beaver Lake	5900	6/18	18	9.2
12B07	Goat Mountain	7000	6/18	0	0
12B04	Wrong Creek	5700	6/18	0	0
12B03	Wrong Ridge	6800	6/18	4	2.6

Judith-Musselshell-Missouri Main Stem Rivers

10C06	Spur Park	8000	6/18	14	7.0
10C01	King's Hill	7500	6/18	4	1.6

Upper Yellowstone River

9D01	Camp Senia	7890	6/16	No Snow	
9D05	Grizzly Peak	8400	6/16	34	15.0
10D06	Independence	8000	6/16	No Snow	
10D12	Monument Peak	9000	6/16	19	8.7
9D04	Timberline Creek	8850	6/16	25	10.8

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